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| 10/777,612 | 02/12/2004 | Bhavesh G. Bhakta | TI-37348 (1962-09300) | 4634 |

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| EXAMINER |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|  | Application No. | Applicant(s) |  |
|---|---|---|---|
| Office Action Summary | 10/777,612 | BHAKTA ET AL. |  |
|  | Examiner | Art Unit |  |
|  | Helene Tayong | 2611 |  |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *10 August 2007*.

2a)☒ This action is **FINAL**.    2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-25* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

## DETAILED ACTION

1.      This office action is in response to the amendment filed on August 8, 2007.

Claims 1-32 are pending in the application. Claims 1-32 are rejected. Claim 14 has

been amended. Claims 26-32 have been canceled. Claim 14 was objected to because

of informalities. Claim 14 has been amended to correct the informalities.

Claims 1, 7, 12, 16, and 26 were rejected under 35 USC102(b) as being anticipated by

Farjad-Rad. Claims 2-5, 8, 10, 11, 13, 14, 17, 19, 27, and 29 were rejected under 35

USC 103(a) as being unpatentable over Farjad-Rad in view of Park. Claims 6, 15, and

28 were rejected under 35 USC 103(a) as being unpatentable over Farjad-Rad in view

of Chen. Claims 20, 23, 25, 30, and 31 were rejected under 35 USC 103(a) as being

unpatentable over Farjad-Rad in view of Park, and further in view of Chen. Claims 22

and 24 were rejected under 35 USC 103(a) as being unpatentable over Farjad-Rad in

view of Park and Chen, and further in view of Tonietto. Claims 21 and 32 were rejected

under 35 USC 103(a) as being unpatentable over Farjad-Rad in view of Park and Chen,

and further in view of Sakaki. Claims 1-25 are pending in this application and have been

considered below.

### *Response to Arguments*

2.      Applicants arguments regarding the rejection rejected under 35 USC102 (b) as

being anticipated by Farjad-Rad. Claims 2-5, 8, 10, 11, 13, 14, 17, 19, 27, and 29 were

rejected under 35 USC 103(a) as being unpatentable over Farjad-Rad in view of Park.

Claims 6, 15, and 28 were rejected under 35 USC 103(a) as being unpatentable over

Farjad-Rad in view of Chen. Claims 20, 23, 25, 30, and 31 were rejected under 35 USC

103(a) as being unpatentable over Farjad-Rad in view of Park, and further in view of

Chen. Claims 22 and 24 were rejected under 35 USC 103(a) as being unpatentable

over Farjad-Rad in view of Park and Chen, and further in view of Tonietto. Claims 21

and 32 were rejected under 35 USC 103(a) as being unpatentable over Farjad-Rad in

view of Park and Chen, and further in view of Sakaki have been fully considered but

they are not persuasive. The examiner thoroughly reviewed Applicant's arguments but

firmly believes that the cited reference reasonably and properly meets the claimed

limitation as rejected.

**(1) Applicant's arguments**: "Claims 1, 12, and 20 include "... a summer coupled

to the sampler and the filter, said summer combines together the input communication

signal with the equalization signals ...". The references of record do not show, teach, or

suggest the above recited limitations of claims 1, 12, and 20. The references of record

fail to teach that a summer combines the input communication signal with the

equalization signals. In Farjad-Rad the N samples are added or subtracted to provide

the filter output. Nothing in Farjad-Rad teaches combining the filter output with the input

communication signal".

**The examiner's response**: In fig. 5, an equalizer that compensates for the low-

pass characteristics of a communication channel is disclosed (col. 5, lines 43-45). In

fig. 5, Farjad-Rad discloses the differential input (10) of the received data stream,

samplers (12) each clocked by a separate phase of a sampling clock and adder (20).

Implementation of a FIR filter is disclosed in col. 5, lines 48-60. In equation (1) col. 5,

lines 62), Farjad-Rad discloses the output of the filters corresponding to sample n.

$$S_{eq}(n) = S_n \mp \alpha S_{n-1} \mp \beta S_{n-2}$$

According to this equation if the sampled data values and their associated

weights are moved to the left hand of the equation (1), then a combination of the input

signals added together with the equalized filter outputs can be shown as thus:

$$\alpha S_{n-1} + \beta S_{n-2} + S_{eq}(n) = S_n$$

Applicants are reminder that the Examiner is entitled to give the broadest

reasonable interpretation to the language of the claim. So the Examiner considers "

summer combines together the input communication signal with the equalization

signals" as "adding together $\alpha S_{n-1} + \beta S_{n-2} + S_{eq}(n) = S_n$" within the broad meaning of the

term. The examiner is not limited to Applicant's definition, which is not specifically set

fourth in the claims. *In re tanaka et al.*, 193 USPQ 139, (CCPA) 1977.

## Claim Rejections - 35 USC § 102

3.      The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.      Claims 1,7,12,16 and 26 are rejected under 35 U.S.C. 102(b) as being

anticipated by Farjad-Rad et al.(US 7167517 B2).

(1) with regards to claims 1, 12 and 26;

Farjad-Rad et al. discloses a receiver equalizer (fig. 5) comprising:

a sampler (12) that samples a signal indicative of an input communication signal

to determine digital decision output signals having a predetermined data rate ( col.5,

lines 53-58);

a filter that receives digital decision output signals from said sampler and

generates equalization signals therefrom ( col. 5, lines 59-67); and

a summer (20) coupled to the sampler and the filter, said summer combines

together the input communication signal with the equalization signals ( col.5, lines 57-

59).

wherein a pluralities of clocks control timing associated with the sample, said

clocks having frequencies that are less than a data rate of the communication device (

col.6, lines 14-16).

(2) with regards to claims 7 and 16 ;

wherein the filter receives unlatched digital decision output signals from said

sampler( col 5., lines 53-67).

## *Claim Rejections - 35 USC § 103*

5.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.      Claims 2-5, 8,10,11,13,14,17 and 19 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Farjad-Rad et al.(US 7167517 B2) in view of Park et al.(US

2004/0076228 A1)

(1) with regards to claim 2;

Farjad-Rad et al. discloses all of subject matter as described above except for

specifically teaching wherein said clocks have frequencies that are one-half the

predetermined data rate.

However, Park et al. in the same field of endeavor, teaches wherein said clocks

have frequencies that are one-half the predetermined data rate (fig. 4 and 5, pg. 2,

[0031], lines 5-6).

Due to a difference in time required for transmitting signals through channels,

there is a time skew between transmitted signals or between a clock and a transmitted

signal The skew has an adverse effect on signal transmission at a high speed. It would

have been obvious to one of ordinary skill in the art at the time the invention was made

to recognize that for the normal operation of an input circuit in a receiver, a setup/hold

time should be sufficient (pg. 1, [0011], lines 8-9).The motivation to utilize Park et al's

clocks instead of Farjad-Rad et al.'s was to improve on high speed transmission.

(2) with regards to claim 3;

Farjad-Rad et al. discloses all of subject matter as described above except for

specifically teaching wherein said clocks include two clocks that are 180 degrees out of

phase with respect to each other and activate the sampler on rising edges of the two

clocks

However, Park et al. in the same field of endeavor, teaches wherein said clocks include two clocks that are 180 degrees out of phase with respect to each other and activate the sampler on rising edges of the two clocks (fig. 5, pg. 3, [0035], lines 13-14).

Due to a difference in time required for transmitting signals through channels, there is a time skew between transmitted signals or between a clock and a transmitted signal The skew has an adverse effect on signal transmission at a high speed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that for the normal operation of an input circuit in a receiver, a setup/hold time should be sufficient (pg. 1, [0011], lines 8-9).The motivation to utilize Park et al's clocks instead of Farjad-Rad et al.'s was to improve on high speed transmission.

(3) with regards to claim 4;

Farjad-Rad et al. discloses all of subject matter as described above except for specifically teaching wherein said plurality of clocks comprise a set of quadrature clocks.

However, Park et al. in the same field of endeavor, teaches wherein said plurality of clocks comprise a set of quadrature clocks (fig. 5, pg. 3, [0035], lines 13-14).

Due to a difference in time required for transmitting signals through channels, there is a time skew between transmitted signals or between a clock and a transmitted signal The skew has an adverse effect on signal transmission at a high speed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that for the normal operation of an input circuit in a receiver, a setup/hold

time should be sufficient (pg. 1, [0011], lines 8-9).The motivation to utilize Park et al's

clocks instead of Farjad-Rad et al.'s was to improve on high speed transmission.

(4) with regards to claim 5;

Farjad-Rad et al. discloses all of subject matter as described above except for

specifically teaching a clock circuit coupled to said filter and said sampler, said clock

circuit generates a plurality of inter-symbol interference ("ISI" cancellation clock signals

that operate said filter from the set of quadrature clocks used to operate the sampler.

However, Park et al. in the same field of endeavor, teaches a clock circuit

coupled to said filter and said sampler, said clock circuit generates a plurality of inter-

symbol interference ("ISI" cancellation clock signals that operate said filter from the set

of quadrature clocks used to operate the sampler (fig. 4, pg. 3, [0034], lines 1-16).

Due to a difference in time required for transmitting signals through channels,

there is a time skew between transmitted signals or between a clock and a transmitted

signal The skew has an adverse effect on signal transmission at a high speed. It would

have been obvious to one of ordinary skill in the art at the time the invention was made

to recognize that for the normal operation of an input circuit in a receiver, a setup/hold

time should be sufficient (pg. 1, [0011], lines 8-9).The motivation to utilize Park et al's

clocks instead of Farjad-Rad et al.'s was to improve on high speed transmission.

(5) with regards to claims 8 and17;

Farjad-Rad et al. discloses all of subject matter as described above except for

specifically teaching wherein said sampler comprises a pair of processing paths, one

path for generating gradient bits and another path for generating data bits , each path

comprising an amplifier and at least one sense amplifier.

However, Park et al. in the same field of endeavor, teaches wherein said sampler

comprises a pair of processing paths, one path for generating gradient bits (odd) and

another path for generating data bits (even), each path comprising an amplifier( 113)

and at least one sense amplifier(125) (pg. 3, [0035], lines 1-7).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to add the processing paths of Park et al.'s to the system of Farjad-

Rad et al in order to compensate for attenuated high -frequency component signals so

that a skew between data and clock are compensated for. The motivation to add these

processing paths will be to facilitate a high speed data transmission (pg.2, [0019], lines

6-7).

(6) with regards to claims 10 and 19;

Farjad-Rad et al. discloses all of subject matter as described above except for

specifically teaching wherein the filter comprises one or more taps, the sampler

comprises one or more sense amplifiers, and wherein equalization can be disabled in

the equalizer while preserving currents from the one or more taps by forcing the one or

more sense amplifiers into a pre-charge state.

However, Park et al. in the same field of endeavor, teaches wherein the filter

comprises one or more taps, the sampler comprises one or more sense amplifiers (fig.

6, 121-128), and wherein equalization can be disabled in the equalizer while preserving

currents from the one or more taps by forcing the one or more sense amplifiers into a pre-charge state( pg. 3, table 1, [0041], lines 1-4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the method of equalization of Park et al in order to acquire the optimal sampling clock for sampling the external data signal. The motivation to combine Park et al's method of equalization will be to achieve a high speed equalization when receiving data.

(7) with regards to claim 11;

Farjad-Rad et al. discloses all of subject matter as described above except for specifically teaching wherein equalization can be enabled by releasing the one or more sense amplifiers from the pre-charge state.

However, Park et al. in the same field of endeavor, teaches wherein equalization can be enabled by releasing the one or more sense amplifiers from the pre-charge state (pg. 3, table 1, [0041], lines 1-4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the method of equalization of Park et al in order to acquire the optimal sampling clock for sampling the external data signal. The motivation to utilize Park et al's method of equalization will be to achieve a high speed equalization when receiving data.

(8) with regards to claim 13;

Farjad-Rad et al. discloses all of subject matter as described above except for specifically teaching wherein the clock circuit comprises variable time delay elements whose time delay can be set during a calibration of the ISI cancellation clocks.

However, Park et al. in the same field of endeavor, teaches wherein the clock circuit comprises variable time delay elements whose time delay can be set during a calibration of the ISI cancellation clocks (Table 1, pg. 3, [0040], lines 5-9).

Due to a difference in time required for transmitting signals through channels, there is a time skew between transmitted signals or between a clock and a transmitted signal The skew has an adverse effect on signal transmission at a high speed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that for the normal operation of an input circuit in a receiver, a setup/hold time should be sufficient (pg. 1, [0011], lines 8-9).The motivation to utilize Park et al's clocks instead of Farjad-Rad et al.'s was to improve on high speed transmission.

(9) with regards to claim 14;

Farjad-Rad et al. discloses all of subject matter as described above except for specifically teaching wherein said quadrature claims have frequencies that are less than a data rate of said digital decision output signals.

However, Park et al. in the same field of endeavor, teaches wherein said quadrature claims have frequencies that are less than a data rate of said digital decision output signals (pg. 2, [0031], lines 5-6).

Due to a difference in time required for transmitting signals through channels, there is a time skew between transmitted signals or between a clock and a transmitted

signal The skew has an adverse effect on signal transmission at a high speed. It would

have been obvious to one of ordinary skill in the art at the time the invention was made

to recognize that for the normal operation of an input circuit in a receiver, a setup/hold

time should be sufficient (pg. 1, [0011], lines 8-9).The motivation to utilize Park et al's

clocks instead of Farjad-Rad et al.'s was to improve on high speed transmission.

7.     Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Farjad-Rad et al. in view of Chen et al.(US 7092437 B2).

    (1) with regards to claims 6  and 15;

    Farjad-Rad et al. discloses all of subject matter as described above except for

specifically teaching wherein the equalizer includes a sensitivity test process in which

the at-speed sensitivity of the equalizer can be determined, the process includes

disabling an input amplifier, providing a predetermined set of tap coefficients to the filter,

determining if the sampler generates a repeating pattern associated with the set of tap

coefficients, and repeating the sensitivity test process with other predetermined sets of

tap coefficients until the sampler no longer determines the repeating pattern associated

the set of tap coefficients provided to the filter .

    However, Chen et al. in the same field of endeavor teaches wherein the

equalizer includes a sensitivity test process in which the at-speed sensitivity (

interpreted as optimal training interval) of the equalizer can be determined, the process

includes disabling an input amplifier, providing a predetermined set of tap coefficients to

the filter, determining if the sampler generates a repeating pattern associated with the

set of tap coefficients, and repeating the sensitivity test process with other

predetermined sets of tap coefficients until the sampler no longer determines the repeating pattern associated the set of tap coefficients provided to the filter ( col. 1, lines 39-54) .

Some current training-based equalization algorithms include schemes for determining intervals for initiating a training sequence. The idea of these schemes is that no training sequence is transmitted until the abrupt change detection algorithm detects changes in channel parameters that may cause an equalizer failure. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the sensitivity test process of Chen et al. in the equalizer system of Farjad-Rad et al. to re-adjust the channel estimates at the receiver so as to recover from channel failure. The motivation to combine these would be to provide a training decision scheme having reduced complexity and improved channel utilization.

8.      Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farjad-Rad et al in view of Tonietto et al ( US2005/0135471 A1).

(1) with regards to claims 9 and18 ;

Farjad-Rad et al. discloses all of subject matter as described above except for specifically teaching the equalization signals comprise inter-symbol interference ("ISI") equalization currents and the equalizer further comprises an input amplifier coupled to the summer and having a gain and the equalizer also comprises a coefficient normalization circuit that normalizes the ISI equalization currents to the input amplifier's gain.

However, Tonietto et al. in the same field of endeavor teaches wherein the equalization signals comprise inter-symbol interference ("ISI") equalization currents ([pg. 1, [0011], lines 1-6) and the equalizer further comprises an input amplifier coupled to the summer (fig. 4, 460) and having a gain and the equalizer also comprises a coefficient normalization circuit that normalizes the ISI equalization currents to the input amplifier's gain (fig. 2, [008], lines 1-13)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize equalization signals comprise inter-symbol interference ("ISI") equalization currents of Torietto et al.'s to the equalization system of Farjad-Rad et al's equalizer in order to efficiently recover data from the data stream in the signal received via the communication media. The motivation to utilize Torietto et al.'s signals equalization signals was to improve on speed of receiver and compensate for the distortions of the channel.

9.      Claims 20, 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farjad-Rad et al, Park et al, as applied to claim 29 above and further in view of Chen et al. (US 7092437 B2).

(1) with regards to claim 20;

Farjad-Rad et al. discloses a receiver equalizer (fig. 5) comprising:

sampler (12)  that samples a signal indicative of an input communication signal to determine digital decision output signals having a predetermined data rate ( col.5, lines 53-58);

a filter that receives digital decision output signals from said sampler and

generates equalization signals therefrom ( col. 5, lines 59-67); and

a summer (20) coupled to the sampler and the filter, said summer combines

together the input communication signal with the equalization signals ( col.5, lines 57-

59).

Farjad-Rad et al discloses all of subject matter as described above except for

specifically teaching

(a) an input amplifier that receives an input communication signal.

(b) wherein the equalizer includes a sensitivity test process in which the at-

speed sensitivity of the equalizer can be determined, the process includes disabling an

input amplifier, providing a predetermined set of tap coefficients to the filter, determining

if the sampler generates a repeating pattern associated with the set of tap coefficients,

and repeating the sensitivity test process with other predetermined sets of tap

coefficients until the sampler no longer determines the repeating pattern associated the

set of tap coefficients provided to the filter .

(i) with regards to item (a) above;

However, park et al. in the same field of endeavor teaches an input amplifier that

receives an input communication signal (fig. 6, 111-114, pg.2, [0033], lines 1-7).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to utilize the input amplifier of Park et al. in the equalizer of Farjad-

Rad et al. in order to reduce the attenuation in high frequency components of signals in

a transmission channel. The motivation to combine Park et al.'s input amplifier to the

equalizer system of Farjad-Rad et al. will be to facilitate a high speed data transmission.

(ii) with regards to item (b) above;

However, Chen et al. in the same field of endeavor teaches wherein the

equalizer includes a sensitivity test process in which the at-speed sensitivity (

interpreted as optimal training interval) of the equalizer can be determined, the process

includes disabling an input amplifier, providing a predetermined set of tap coefficients to

the filter, determining if the sampler generates a repeating pattern associated with the

set of tap coefficients, and repeating the sensitivity test process with other

predetermined sets of tap coefficients until the sampler no longer determines the

repeating pattern associated the set of tap coefficients provided to the filter ( col. 1, lines

39-54) .

Some current training-based equalization algorithms include schemes for

determining intervals for initiating a training sequence. The idea of these schemes is

that no training sequence is transmitted until the abrupt change detection algorithm

detects changes in channel parameters that may cause an equalizer failure. It would

have been obvious to one of ordinary skill in the art at the time the invention was made

to utilize the sensitivity test process of Chen et al. in the equalizer system of Farjad-Rad

et al. to re-adjust the channel estimates at the receiver so as to recover from channel

failure. The motivation to combine these would be to provide a training decision scheme

having reduced complexity and improved channel utilization.

(2) with regards to claim 23;

Farjad-Rad et al. discloses all of subject matter as described above except for specifically teaching wherein said sampler comprises a pair of processing paths, one path for generating gradient bits and another path for generating data bits, each path comprising an amplifier and at least one sense amplifier.

However, Park et al. in the same field of endeavor, teaches wherein said sampler comprises a pair of processing paths, one path for generating gradient bits (odd) and another path for generating data bits (even), each path comprising an amplifier (113) and at least one sense amplifier(125) (pg. 3, [0035], lines 1-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the processing paths of Park et al.'s to the system of Farjad-Rad et al in order to compensate for attenuated high -frequency component signals so that a skew between data and clock are compensated for. The motivation to add these processing paths will be to facilitate a high speed data transmission (pg.2, [0019], lines 6-7).


(3) with regards to claim 25

Farjad-Rad et al. discloses all of subject matter as described above except for specifically teaching wherein the filter comprises one or more taps, the sampler comprises one or more sense amplifiers, and wherein equalization can be disabled in the equalizer while preserving currents from the one or more taps by forcing the one or more sense amplifiers into a pre-charge state.

However, Park et al. in the same field of endeavor, teaches wherein the filter comprises one or more taps, the sampler comprises one or more sense amplifiers (fig. 6, 121-128), and wherein equalization can be disabled in the equalizer while preserving currents from the one or more taps by forcing the one or more sense amplifiers into a pre-charge state( pg. 3, table 1, [0041], lines 1-4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the method of equalization of Park et al in order to acquire the optimal sampling clock for sampling the external data signal. The motivation to combine Park et al's method of equalization will be to achieve a high speed equalization when receiving data.

10.     Claims 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farjad-Rad et al., Park et al. and Chen et al. as applied to claim 20 above and further in view of Tonietto et al (US2005/0135471 A1)

(1) with regards to claim 22;

Farjad-Rad et al., Park et al, as modified by Chen et al. discloses all of subject matter as described above except for specifically teaching wherein the filter receives unlatched digital decision output signals from said sampler.

However, Tonietto et al. in the same field of endeavor teaches wherein the filter receives unlatched digital decision output signals from said sampler( fig.6, pg.4,[0053], lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize unlatched digital decision output signals of Torietto et al.'s

to the equalization system of Farjad-Rad et al. , Park et al, as modified by Chen's
equalizer in order to efficiently recover data from the data stream in the signal received
via the communication media. The motivation to utilize Torietto et al.'s signals
equalization signals was to improve on speed of receiver and compensate for the
distortions of the channel.

(2) with regards to claim 24 ;

Farjad-Rad et al., Park et al, as modified by Chen et al. discloses all of subject
matter as described above except for specifically teaching the equalization signals
comprise inter-symbol interference ("ISI") equalization currents and the equalizer further
comprises an input amplifier coupled to the summer and having a gain and the
equalizer also comprises a coefficient normalization circuit that normalizes the ISI
equalization currents to the input amplifier's gain.

However, Tonietto et al. in the same field of endeavor teaches wherein the
equalization signals comprise inter-symbol interference ("ISI") equalization currents
([pg. 1, [0011], lines 1-6) and the equalizer further comprises an input amplifier coupled
to the summer (fig. 4, 460) and having a gain and the equalizer also comprises a
coefficient normalization circuit that normalizes the ISI equalization currents to the input
amplifier's gain (fig. 2, [008], lines 1-13)

It would have been obvious to one of ordinary skill in the art at the time the
invention was made to utilize equalization signals comprise inter-symbol interference
("ISI") equalization currents of Torietto et al.'s to the equalization system of Farjad-Rad
et al. , Park et al, as modified by Chen's equalizer in order to efficiently recover data

from the data stream in the signal received via the communication media. The

motivation to utilize Torietto et al.'s signals equalization signals was to improve on

speed of receiver and compensate for the distortions of the channel.

11.     Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Farjad-

Rad et al, Park et al. and Chen et al.(US 7092437 B2)  as applied to claims 20 above,

and further in view of Sakaki et al.(US 4145747)

      (1) with regards to claim 21;

      Farjad-Rad et al. and Park as modified by Chen discloses all of subject matter as

described above except for specifically teaching wherein the sets of tap coefficients are

provided to the filter in order from a maximum value to a minimum value of the tap

coefficients.

      However, Sakaki et al. in the same field of endeavor, teaches the sets of tap

coefficients are provided to the filter in order from a maximum value to a minimum value

of the tap coefficients (fig. 1,col. 2, lines 31-36).

      Tap coefficients are calculated for every operational cycle of the equalizer. This

causes a slow convergence of the value to the tap coefficient. It would have been

obvious to one of ordinary skill in the art at the time the invention was made to utilize the

set of tap coefficients of Sakaki et al to the teachings of Farjad-Rad et al and Park et al.

as modified by Chen. The motivation to utilize these tap coefficients would be to provide

rapid convergence of a tap gain control coefficients.

### *Conclusion*

12.     **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action.  In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action.  In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Helene Tayong whose telephone number is 571-270-

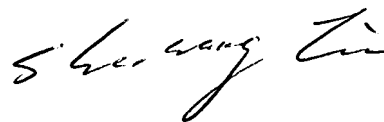1675.  The examiner can normally be reached on Monday-Friday 8:00 am to 5:30 pm

EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Liu Shuwang can be reached on 571-272-3036.  The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

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Helene Tayong

10/4/07